

Helper T-cell Epitopes – Nef

Location	Epitope Comments	Antigen	Species(HLA or haplotype)	Reference
Nef(45-69 BRU)	SSNTAATNAACAWLEAQEEEEVGFP Antigenic domain: ATNAACAWL; priming with peptide enhanced subsequent Ab response to Nef protein immunization	rec Nef	rat and chimpanzee	[Estquier (1992)]
Nef(98-112 BRU)	EGLIHSQRQDILDL Peptide alone could stimulate monkey T-cells in the absence of carrier protein; required carrier protein in rat	rec Nef	chimpanzee	[Estquier (1992)]

nef Helper-EPITOPES

1 MGGIWSKRSGSGWPAIRERMKRAEPAAEVGAVSRDLAKHGAIT**SSNENN** 50 ←

51 **ADCVWLKAQEDEEVGFPVRPQVPLRPMTYKAAHDLSHFLKEKGGL****EGLIY** 100 ←

101 **SQKRQDILDL**WVYHTQGFFPDWQNYTPPGTRYPLCFGWCFKLVPVEPEK 150

151 VEEANEGENNSLLHPMSLHGMDDEKEVLMWKFD200

201 FKDC 204

HIV Helper T-cell Epitopes

Epitopes and protein variability:

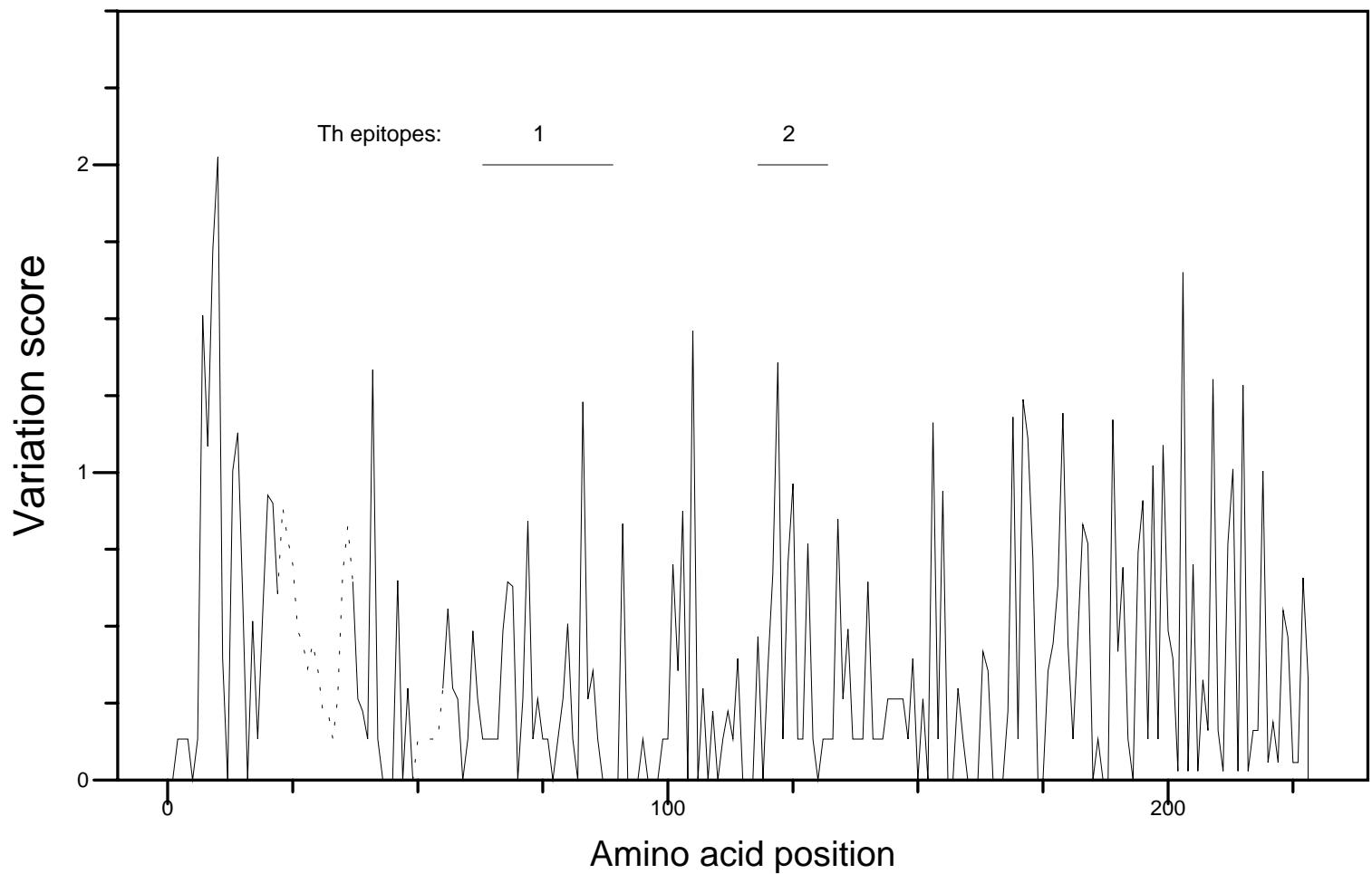
This plot shows a score that is a measure of variability for each position in the Nef protein alignment, and the relative positions of regions with defined helper epitopes as seen on the helper epitope map. The solid lines are positions where the most common character in a Nef protein alignment is an amino acid; the dashed lines represent regions where the most common character is an insertion (dash) incorporated to maintain the alignments. The alignment used corresponds to the 1995 Nef protein alignment, publically available at the Human Retroviruses and AIDS database, totaling 34 sequences. See the "how to use the helper section" information for more details on the variability measure. The higher scores indicate more variation; 0 is perfectly conserved. The different protein alignments (gp120, gp41, p24, p15, p17, Nef and RT) used to create these plots contain different sets of sequences; therefore each plot is internally consistent, but cannot be compared to other protein plots.

Most common amino acid in each position in the Nef protein is shown below. The numbering corresponds to the numbering in the variability plot for the Nef protein.

NEF CONSENSUS:

```
MGGKWSKSSMVGWPAVRERMRA-----EPAADGVGAVSRD  50
-----LEKHGAITSSNTAATNADCWLEAQ--EEEVGFPVRPQVPLRPM 100
TYKAADVDSLHFLKEKGGLIYSQKRQDILDLWVYHTQGYFPDWQNYTP 150
GPGIRYPLTFGWCFLVPVEPEKVE-EANEGENNSLLHPMSLHGMDDPER 200
EVLEWRFDSDLAFHHMARELHPEYY-KDC
```

Variation in positions in the Nef protein



HIV Helper T-cell Epitopes

Nef Helper Epitope 1

CONSENSUS-B SSNTAAATNADCAWLEAQ?EEEEEVGFP
Epitope1 -----.

CONSENSUS-A ----SS---S----.---GD----
HIVU455 ----SS---S----.---GD----

CONSENSUS-B -----
HIVLAI -----A-----
HIVNL43 -----N--A-----
HIVGLNEF3 -----.
HIVGLNEF5 -----A-----
HIVGLNEF6 -----A-----
HIVBRVA -----.-D-----
HIVMN -----.
HIVSC -----P-N-----
HIVBAL1 -----N-----.-D-----
HIVJRCSF -----Y..-D-----
HIVJRFL -----.-D-----
HIVNH53 -----N--V-----
HIVOYI -----.-D-----
HIVSF2 -----.
HIVSF162 -----N-----.-D-D-----
HIVCAM1 -----.
HIVHEI20BL -----.-D-----
HIVHEI28BL -N-----E.-G-----
HIVHEI39BL -----.-D-----
HIVHEI3BL -----.-X-X-----
HIVHEI4BL N----N-----.-G-----
HIVSF33 -----.-D-----
HIVSWB84 -----.
HIVHAN -----TN--A-----.-E-----
HIVD31 -----P---A-----.
HIVRF -----N--A-T----ED-D-----
HIVYU2 -----.
HIVBCSG3C -----N-----.

CONSENSUS-D -----S-----E.-S-----
HIVELI -----S-----E.-SD-----
HIVNDK -----S--DT-----E.-S-----
HIVZ6 -----RD-----E.-S-----

CONSENSUS-O --H-PQN--AL-F-?SH..??.?----
HIVANT70 --H-PQN--AL-F--SH..Q-----
HIVMVP5180 --H-PQN--AL-F-DSH..KD-D----

SIVCPZGAB -R--PE--QTL----EM..DN-----

CONSENSUS-U --??.?N-??-.??.??.?E.-?----
HIVMAL --SP--N--S----PPE-----
HIVZ321 -----TN-P-----E.-S-----

Nef Helper Epitope 2

CONSENSUS-B EGLI?SQKRQDILD
Epitope2 -----H-----

CONSENSUS-A D---H----E----
HIVU455 D---H----E----

CONSENSUS-B -----
HIVLAI -----H--R-----
HIVNL43 -----H--R-----
HIVGLNEF3 ---VH-----
HIVGLNEF5 ---TY-----
HIVGLNEF6 ---H--R-----
HIVBRVA -----H--Q-----
HIVMN D---Y-----
HIVSC -----TPREDKIS-IC
HIVBAL1 -----H-----
HIVJRCSF -----Y-----
HIVJRFL -----H-----
HIVNH53 -----F-----E-----
HIVOYI -----Y-----
HIVSF2 -----W--R--E----
HIVSF162 -----Y-----
HIVCAM1 --I-Y--R-----
HIVHEI20BL --VY--R--E----
HIVHEI28BL --VY--X-----
HIVHEI39BL D-M-Y-----E-----
HIVHEI3BL --I-Y-----
HIVHEI4BL -----W-----
HIVSF33 -----VY-----
HIVSWB84 -----VH-----E-----
HIVHAN -----Y-P--E----
HIVD31 -----VH-----
HIVRF D--VF-----
HIVYU2 -----H--Q-----
HIVBCSG3C -----F--R-----

CONSENSUS-D -----W-K---E----
HIVELI -----W-K---E----
HIVNDK -----W-K---E----
HIVZ6 -----W-K---E----

CONSENSUS-O ?---Y-H--AE----
HIVANT70 -----Y-H--AE----
HIVMVP5180 D---Y-H--AE----

SIVCPZGAB ---VY-RR--E----

CONSENSUS-U D---?---?---E----
HIVMAL D--VW-P---E----
HIVZ321 D---Y-K---E----